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(54) Motor-vehicle engine bonnet incorporating a ventilation air inlet

(57) An engine bonnet for a motor vehicle has an inner reinforcement 3 of the engine bonnet panel 1, designed in such a way along that side of the engine bonnet which is adjacent the windscreen that it simultaneously feeds the air stream entering via an air inlet 19 in the engine bonnet to an air-flow chamber 10 situated upstream of the air intake duct 22 of the heating or air-conditioning system and constitutes a means of water separation.

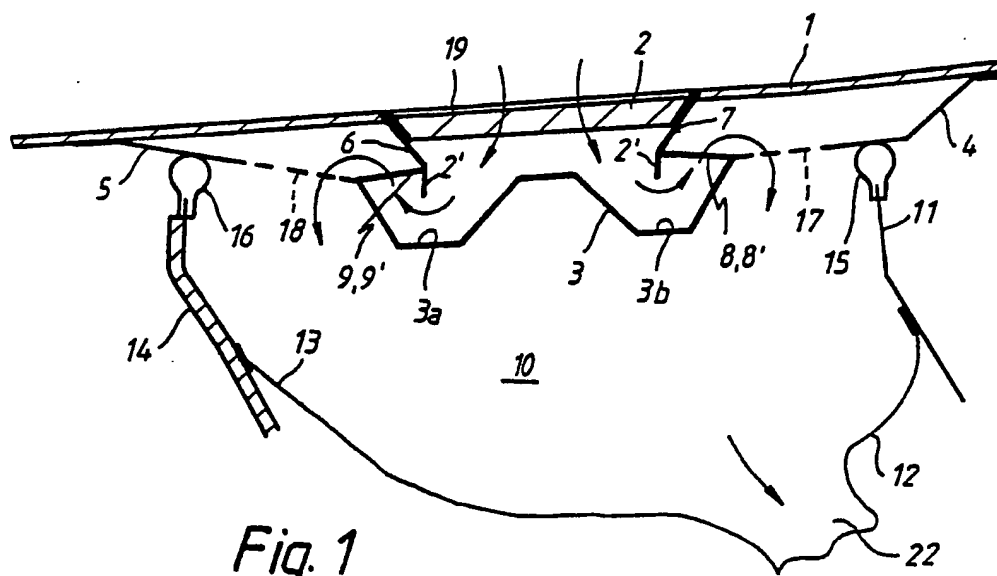


Fig. 1

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Fig. 1

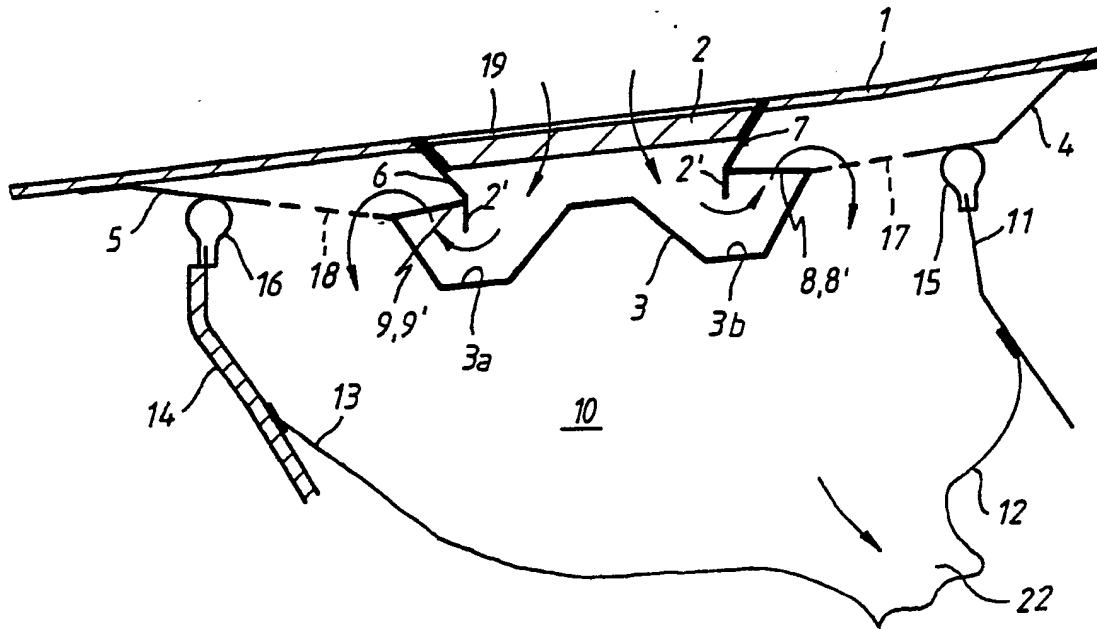


Fig. 2

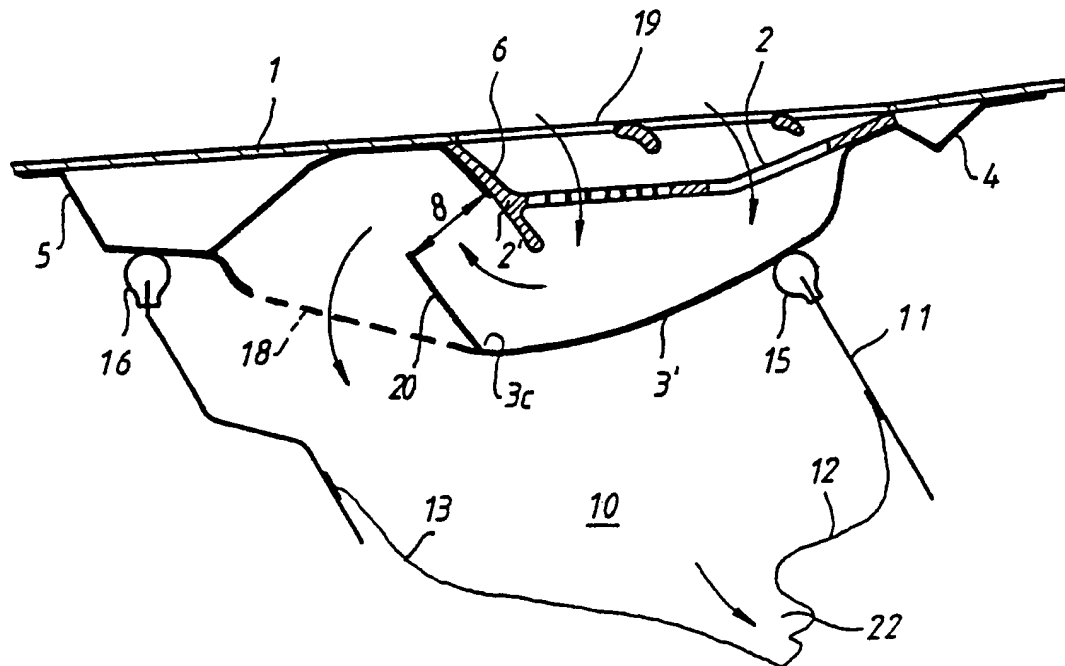
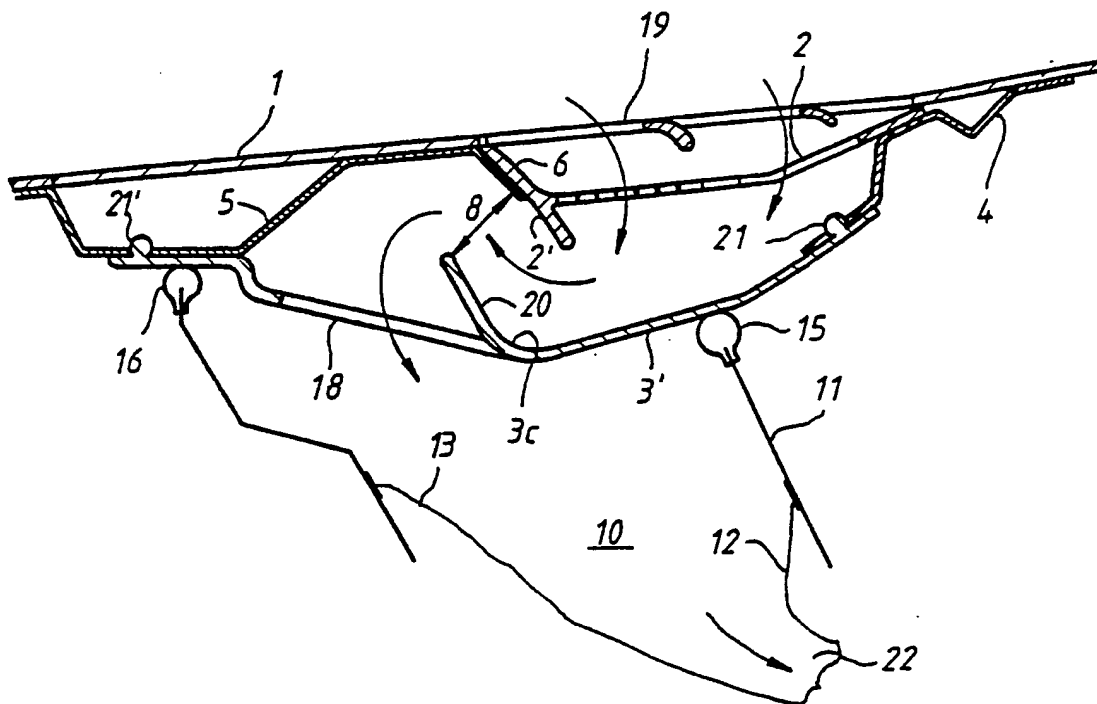


Fig. 3



Engine bonnet for motor vehicles

The invention relates to an engine bonnet for a motor vehicle having an air inlet for a heating or air-conditioning system.

Through the air inlet opening, situated in the accumulation region in front of the windscreen, for the fresh air supply to a heating or air-conditioning system, dirt particles and, in particular, water can also penetrate undesirably. Said water must be prevented from getting into the inside of the vehicle with the airstream.

Thus, in German Patent 1,680,065, diversion or deflection devices are fitted within a plenum chamber and provided with outlet devices. For this purpose, however, additional parts are necessary, which are furthermore not accessible in a simple manner for purposes of cleaning.

The present invention seeks to achieve separation of water from the fresh air fed to a heating or air-conditioning system of a motor vehicle without involving expensive additional parts.

According to the present invention there is provided an engine bonnet for a motor vehicle, which is provided with an air inlet opening for the supply of air for a heating or air-conditioning system and with a reinforcement on the inside, guide passages for the air flowing in being provided between the air inlet opening and the heating or air-conditioning system, wherein the region of the reinforcement underneath the air inlet opening forms at least one trough closed at the bottom and the inlet openings of the guide passages are arranged at the trough edge.

A reinforcement of the engine bonnet in the region of the air inlet opening, said reinforcement being necessary in any case for reasons of stability, is constructed in such a way that it simultaneously guides

the inflowing air stream into a hollow and from there into a higher region before the air stream leaves the engine bonnet reinforcement in the direction of the heating or air-conditioning system. By means of this design it is possible in an advantageous manner to integrate a water separation facility into the reinforcement of the engine bonnets of motor vehicles and thus to dispense with further additional parts.

If the region of the reinforcement underneath the air inlet opening rests air tightly on an air flow chamber, special air guidance which permits optimum water separation is achieved.

The invention is illustrated in the drawings by means of exemplary embodiments and explained below. In the drawings:

Fig. 1 shows a schematic longitudinal section through an engine bonnet in the region of the air inlet opening, with an inner reinforcement according to the invention,

Fig. 2 shows an analogous longitudinal section through a further embodiment of the invention and

Fig. 3 shows a longitudinal section through a third embodiment.

Fig. 1 shows an air inlet opening 19 in the engine bonnet 1, which is provided with an air inlet grille 2 which ends flush with the engine bonnet and holds back coarse dirt particles. In order to facilitate accessibility to the parts situated underneath it, the air inlet grille 2 is secured on the engine bonnet 1 or on air guide plates 6, 7 forming an inlet nozzle for the air in such a way that it can be removed outwards. Extending underneath the air inlet opening 19 is a section 3 of the engine bonnet reinforcement, which is W-shaped in cross section, two self-contained troughs 3a, 3b thus being formed. A division of the air stream thereby takes place and then a deflection of the two part-streams by virtue of the fact that the air guide

plates 6, 7 are extended into the troughs 3a, 3b to below the trough edge and limit the inlet cross section. This measure compels an upward deflection of the air stream in the region of the troughs and thereby makes possible optimum separation of water, which remains in the troughs.

The section 3 of the engine bonnet reinforcement which forms the troughs 3a, 3b, 3c rests air tightly on an air-fill chamber 10, as will be described below in detail.

After passing through the troughs, the two air streams pass through the inlet openings 8, 9, fitted with air-permeable braces 8', 9' between the trough edge and the air guide plates 6, 7, into guide passages which lead to a heating or air-conditioning system. During this process, the air streams first of all pass upwards into two air chambers directly underneath the engine bonnet, are there deflected again and leave the region of the reinforcement downwards via two air outlet openings 17, 18 designed as air-permeable sections of the reinforcement of the engine bonnet into an air-fill chamber 10 delimited by air guide plates 11, 12, 13, from where the air is passed on to the heating or air-conditioning system. Adjoining the air outlet openings 17, 18 on both sides are parts 4, 5 of the section 3 of the engine bonnet reinforcement, said parts again being self-contained and being carried against the inside of the engine bonnet panel and firmly attached there. With these parts 4, 5, the engine bonnet reinforcement rests air tightly against seals 15, 16. The seals 15, 16 guarantee that, with the engine bonnet 1 closed, intake air can only get to the air-fill chamber 10 through the air inlet opening 19 of the engine bonnet 1. Contaminated air or gases from the engine compartment adjoining the front wall 14 are thereby prevented from getting into the heating or air-conditioning system. By means of the described ducting of the air stream, fine dirt or water

can settle in the two troughs 3a, 3b. The desired water separation is thus guaranteed without further additional parts by the design of the reinforcement according to the invention and the troughs 3a, 3b are easily accessible for purposes of cleaning.

In an embodiment according to Fig. 2, the air inlet grille 2 is attached to sections of the reinforcement underneath air inlet opening 19 of the engine bonnet 1. Both the rib-shaped air inlet opening 19 and the air inlet grille 2 are secured in such a way that they can be removed outwards for purposes of cleaning. That part 4 of the engine bonnet reinforcement in the region of the air inlet opening which is on the wind-screen side is of self-contained design and secured on the engine bonnet 1. Adjoining the section 3' in the region of the air inlet opening 19, said section likewise being of self-contained design and ending in the form of a trough 3c, there is once again, at the front side, a section 18, like a perforated plate, of the reinforcement, which section serves as an air outlet opening and is again attached to the inside of the engine bonnet panel 1, via section 5, which is of self-contained design. In contrast to the embodiment according to Fig. 1, only one trough is provided and the air stream is not divided. A side wall 20 of the trough is used to deflect the air stream forwards and upwards. For optimum deflection of the air stream, the forward wall 6 of the air inlet grille 2 is extended downwards 2' in the direction of the trough as far as the level of the trough edge, which, with the wall 6 situated opposite, forms the inlet opening 8 of the air guide passage. After passing through the inlet opening 8, the air stream is deflected again by the self-contained section 5 of the reinforcement and emerges downwards from the reinforcement through the perforated plate 18 into the air-fill chamber 10 delimited by the guide plates 11, 12, 13, from where the air is fed in a known manner, via a

feed duct 22 to the heating or air-conditioning system, as in the embodiment of Fig. 1.

In Fig. 3, the arrangement of the inner reinforcement largely corresponds to the embodiment illustrated in Fig. 2. However, the reinforcement is now fabricated from plastic and the trough region 3c together with the air-permeable section 18 is attached releasably, via simple plug-in connections 21, 21', to the self-contained sections 4 and 5 of the reinforcement, which are firmly connected to the engine bonnet. To remove dirt which has settled there, the trough can thus be removed inwards in a simple manner when the bonnet is open, and cleaned.



Claims

1. An engine bonnet for a motor vehicle, which is provided with an air inlet opening for the supply of air for a heating or air-conditioning system and with a reinforcement on the inside, guide passages for the air flowing in being provided between the air inlet opening and the heating or air-conditioning system, wherein the region of the reinforcement underneath the air inlet opening forms at least one trough closed at the bottom and the inlet openings of the guide passages are arranged at the trough edge.
2. An engine bonnet according to Claim 1, wherein the region of the reinforcement underneath the air inlet opening rests air tightly on an air flow chamber.
3. An engine bonnet according to Claim 1 or 2, having an inward-projecting inlet nozzle at the air inlet opening, wherein at least one wall of the inlet nozzle projects into the region of the trough at least as far as the level of the trough edge.
4. An engine bonnet according to any one of Claims 1 to 3, wherein two troughs are formed by a section of W-shaped cross-section and the air stream divided in this way is fed to an air flow chamber via two inlet openings with downstream guide passages.
5. An engine bonnet according to Claim 3 or 4, wherein the wall of the inlet nozzle is connected to the reinforcement of the engine bonnet via braces arranged in the region of the inlet openings of the guide passages.
6. An engine bonnet according to any one of Claims 1 to 5, wherein the air inlet opening is provided with an air inlet grille.

7. An engine bonnet according to Claim 6, wherein the air inlet grille ends flush with the engine bonnet and is secured in such a way that it can be removed outwards.

8. An engine bonnet according to any one of Claims 1 to 7, wherein the troughs are releasably secured.

9. An engine bonnet according to Claim 8, wherein the inner reinforcement is fabricated from plastic and the trough is secured releasably by plug-in connections.

10. An engine bonnet for a motor vehicle, substantially as described herein, with reference to, and as illustrated in, the accompanying drawings.